

WHAT IS CLAIMED IS:

- 1 1. A method of generating a continuous parametric model of an electronic circuit
2 parameter having a base model, comprising the steps:
 - 3 determining whether the base model exhibits at least one discontinuity over an allowable
4 range of parameters;
 - 5 if the base model exhibits at least one discontinuity, applying at least one compensation
6 function to prevent the base model from exhibiting discontinuities over the allowable range of
7 parameters;
 - 8 determining whether the first derivative of the base model exhibits at least one
9 discontinuity over the allowable range of parameters; and
 - 10 if the first derivative of the base model exhibits at least one discontinuity, applying at
11 least one compensation constant to prevent a first derivative of the base model from exhibiting
12 discontinuities over the permissible parametric range.
- 1 2. The method of claim 1 wherein the base model takes the form
$$2 \quad A_{eff} = A_0 - \frac{1}{2}[(A_0 - A - \delta) + \sqrt{(A_0 - A - \delta)^2 + 4 \bullet \delta \bullet A_0}].$$
- 1 3. The method of claim 2, wherein the at least one compensation function is
2 substituted into the base model in place of the constant term δ in the base model.
- 1 4. The method of claim 3, wherein the at least one compensation function takes the
2 form of $\theta(A_0) = \frac{A_0}{K}.$
- 1 5. The method of claim 4, wherein the at least one compensation function further
2 comprises a second compensation function which is substituted for the term $A_0.$

1 6. The method of claim 5, wherein the second compensation function takes the
2 form, $A_0^* = A_0 + \Delta \bullet \exp(-A_0^2)$, where Δ is a constant having a value significantly less than A_0 .

1 7. The method of claim 6, wherein the compensation constant Δ is applied to the
2 base model and the resulting enhanced continuous parametric model is represented as

3
$$A_{\text{eff}} = A_0 - \frac{1}{2} \left\{ (A_0 - A - \theta - \Delta) + \sqrt{(A_0 - A - \theta)^2 + 4\theta A_0 + 2\sqrt{A_0^2} \Delta + 2\sqrt{\theta^2} \bullet \Delta + \Delta^2} \right\}.$$

1 8. The method of claim 7, wherein A_{eff} , A_0 and A represent voltage parameters of an
2 electronic component.

1 9. The method of claim 7, wherein A_{eff} , A_0 and A represent current parameters of an
2 electronic component.

1 10. The method of claim 7, wherein A_{eff} , A_0 and A represent power parameters of an
2 electronic component.

1 11. A continuous parametric model of a physical circuit element comprising:
2 a base model, said base model defining a representation of the circuit element,
3 said base model exhibiting at least one of a discontinuity over an allowable range of model
4 parameters and a discontinuity in the first derivative of the allowable range of model parameters;
5 at least one compensation function to remove the discontinuities of the base
6 model over the allowable range of parametric values; and
7 at least one compensation constant to prevent a first derivative of the base model
8 from exhibiting discontinuities over the allowable range of parameters.

1 12. The continuous parametric model method of claim 11, wherein the base
2 model takes the form

3
$$A_{eff} = A_0 - \frac{1}{2}[(A_0 - A - \delta) + \sqrt{(A_0 - A - \delta)^2 + 4 \bullet \delta \bullet A_0}].$$

1 13. The continuous parametric model method of claim 12, wherein the at least one
2 compensation function is substituted into the base model in place of the constant term δ in the
3 base model.

1 14. The continuous parametric model method of claim 13, wherein the at least one
2 compensation function takes the form of $\theta(A_0) = \frac{A_0}{K}$.

1 15. The continuous parametric model method of claim 14, wherein the at least one
2 compensation function further comprises a second compensation function which is substituted
3 for the term A_0 .

1 16. The continuous parametric model method of claim 15, wherein the second
2 compensation function takes the form $A_0^* = A_0 + \Delta \bullet \exp(-A_0^2)$, where Δ is a constant having a
3 value significantly less than A_0 .

1 17. The continuous parametric model method of claim 16, wherein the compensation
2 constant Δ is applied to the base model and the resulting enhanced continuous parametric model
3 is represented as

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$$A_{eff} = A_0 - \frac{1}{2} \left\{ (A_0 - A - \theta - \Delta) + \sqrt{(A_0 - A - \theta)^2 + 4\theta A_0 + 2\sqrt{A_0^2} \Delta + 2\sqrt{\theta^2} \bullet \Delta + \Delta^2} \right\}.$$

1 18. The continuous parametric model method of claim 17, wherein A_{eff} , A_0 and A
2 represent voltage parameters of an electronic component.

1 19. The continuous parametric model method of claim 17, wherein A_{eff} , A_0 and A
2 represent current parameters of an electronic component.

1 20. The continuous parametric model method of claim 17, wherein A_{eff} , A_0 and A
2 represent power parameters of an electronic component.